If you are using a printed copy of this procedure, and not the on-screen version, then you MUST make sure the dates at the bottom of the printed copy and the on-screen version match.
The on-screen version of the Collider-Accelerator Department Procedure is the Official Version.
Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A.

C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

9.1.9.c Guide to Preparing a Fault Study Plan (FSP)

Text pages 2 through 4

C-A-OPM Procedures in which this Attachment is used.		
9.1.9		

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: _____***Signature on File***_____ _____
Collider-Accelerator Department Chairman Date

D. Beavis

Fault Study Plan

1. A Fault Study Plan (FSP) must be written by someone knowledgeable in the beam properties of the area and approved by a representative of the Radiation Safety Committee.

2. Although each beam fault study will be specific to a certain area, there are several common questions/concerns that should be addressed and a general format to follow.

   A general outline and an example are presented below.

   General Outline

   Prepared by:_____(person(s) knowledgeable in the area beam properties).

   Reviewed by:_____ (RSC representative)
   Date: _____

   Fault Study No._____

   Goal(s):

   1. Produce a beam fault at a specific location.
   2. Measure prompt radiation at appropriate locations.

      Method(s):

   1. Document running conditions in the area before fault studies, (usually running for the physics program).
   2. Establish the detuned non-fault beam operating conditions before starting the fault study.
   3. Specify the following:

      - device(s) to change in order to produce desired beam loss conditions,
      - alternate/additional device(s) to change to refine beam loss,
      - beam parameters to monitor while creating beam loss,
      - alternate/additional beam parameters to monitor that may be of use.

Comments:

1. Sufficient beam fault studies must be planned and conducted to assure that the associated areas are measured and documented.
2. There must be an estimate made of the pulsed radiation levels in the fault study area before beginning a study.
3. A radiation work permit must be issued if indicated by dose estimates.
4. The areas where the measurements are to be taken should be defined prior to beginning the fault study. Where appropriate, these locations should be secured by signs and tapes and swept for personnel prior to testing. (Measurements in other areas associated with the fault may always be taken during the fault study.)

5. If, in order to properly conduct the beam fault studies there need be any modifications to the C-A Access Control System (ACS) and/or Particle Accelerator Safety System (PASS), these modifications must follow established guidelines for review approval prior to implementation.

Survey Location(s):

Example FSP:

Fault Study Plan

Prepared by: K. Reece

Reviewed by:_____

Date:_____

FAULT STUDY NO._____

Goal: To produce a maximum primary beam loss fault in the downstream SEB switchyard cave area and measure the prompt radiation through the side-wall shielding and roof shielding. Additional shielding was added over the cave roof on 4/25/90. This study is necessary in order to document the effectiveness of the shielding effort.

Original (non-fault) beam conditions: Establish a cleanly extracted beam at an intensity of 1.0E12 protons/pulse from the AGS and transported with loss on the "B" target station.

Method: Reduce the current to the series dipole string of BD5-8 until the C-A SEB loss monitor system indicates a local beam loss in the downstream switchyard cave (at loss monitor BL400). May also require a change in the set-point of BD4 and/or BQ10 power supply to localize the loss.

Survey Location:

- Use proper caution near any water cooled buss.
- Try to stand to the side of the penetration to reduce dose.
- All surveys done using the HP1010 meter unless otherwise noted.

Chipmunks located on the roof shielding at columns F17, F18, F19 and G20. Their outputs are fed into scalers located in area away from the prompt radiation environment.

Survey at normal beam height along the shield wall from the "Old "D" Gate" to power supply #251, (note trenches).

Survey on the stairs across from Switchyard Downstream Escape Gate at several points in elevation.

Survey on walkway over the downstream switchyard cave shielding near the Switchyard Downstream Escape Gate.

Radiation estimates: From previous fault studies in the area, at $1x10^{12}$ protons per 3 seconds, the highest pulsed radiation levels in these areas should be less than 35 mrem/hr.